

REMARKS

Reconsideration and allowance in view of the foregoing amendment and the following remarks are respectfully requested.

Claims 1-2, 4-5, 7-9, 11-13, 15-16, and 19-32 are now pending. New claim 28 has been added hereinabove. This dependent claim is based on the disclosure in particular at page 16, lines 4-6 and page 17, line 14. New dependent claim 29 is based on the disclosure at page 17, line 10. New claim 30 derives from the disclosure at page 22, line 17 and new claim 31 derives from the disclosure at page 23, line 18. Finally, new claim 32 is supported by the disclosure at page 23, line 20.

Formal drawings are submitted herewith. It is respectfully requested that the herewith formal drawings be substituted for the drawings originally filed. It is respectfully requested that the Examiner indicate approval of the formal drawings in the next Official Communication.

Claim 18 was objected to because of a noted informality. Claim 18 has been incorporated into amended claim 15, revised as suggested by the Examiner. Reconsideration and withdrawal of the objection are requested.

The drawings were objected to under 37 CFR 1.83(a) as allegedly failing to show the subject matter of claim 19. The disclosure was also objected to as the subject matter of claim 19 was allegedly not disclosed in the specification. Reconsideration of the objections to the drawings and to the disclosure is respectfully requested. The arrangement of claim 19 is illustrated in Figures 15A and 15B and is described in the "Other Embodiments" section on page 31, in particular at lines 6-14. In view of the foregoing, reconsideration and withdrawal of the objection to the drawings and reconsideration and withdrawal of the objection to the disclosure are respectfully requested.

Original claims 1-2, 5, 8-9, 12-13 and 15-16 were rejected under 35 USC 103(a) as unpatentable over Nakahara. Applicant respectfully traverses this rejection.

The invention as recited in particular in amended claims 1, 5, 8, 12 and 15, is characterized in particular in the following three features:

First, the axis of the center electrode tip is in a cross or skew relationship with the axis of the ground electrode tip.

Second, the ground electrode tip protrudes towards the center electrode by a protruding length in a range from 0.3 mm to 1.5 mm with respect to the side surface of the distal portion of the ground electrode.

Third, the center electrode tip has a cylindrical shape with a cross sectional area in the range from 0.07 mm^2 to 0.79 mm^2 and the ground electrode tip has a cylindrical shape with a cross sectional area in a range from 0.07 mm^2 to 1.13 mm^2 .

The above-mentioned second feature was recited in original dependent claims 3, 6, 10, 14 and 17 and the third feature was recited in original dependent claim 18. In view of the amendments to the independent claims noted above, the Examiner's rejection based on Nakahara, alone, has been mooted.

Original claims 3, 6, 10, 14 and 17 were rejected under 35 USC 103(a) as being unpatentable over Nakahara in view of Mitsudo. Applicant respectfully traverses this rejection.

In order to prove obviousness, a challenger must present prior art references which disclose the claimed subject matter of the patent/application in question. If separate prior art references each disclose separate elements of a claim, the challenger must also show some teaching, suggestion, or incentive in the prior art that would have led one of ordinary skill in the art to make the claimed combination. See, e.g., Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 304-05 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986). In determining obviousness, there must be some reason other than hindsight for selectively combining the prior art references to render the claimed invention obvious. See, e.g., Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

Nakahara discloses a spark plug in which an axis of the center electrode tip is in a cross or skew relationship with an axis of the ground electrode tip.

According to the spark plug disclosed in Nakahara, the discharge gap causing a spark discharge is offset towards the proximal end side of the ground electrode compared with the axis of the center electrode. This arrangement is disadvantageous in that the growth of flame kernel is disturbed by the ground electrode. The ignitability is thus worsened.

As recognized by the Examiner, Nakahara fails to teach or suggest the above-described characteristics of the invention, in particular, the second and third features noted above. The Examiner cites Mitsudo as teaching a ground electrode tip protruding length as claimed in certain of applicant's dependent claims and now recited in independent claims 1, 5, 8, 12 and 15. However, Mitsudo teaches the protruding length noted by the Examiner in respect to axially aligned center electrode and ground electrode tips. As such, Mitsudo does not teach or suggest that the cross or skewed tips of Nakahara should be in the claimed range. Thus, it is respectfully submitted that the Examiner has taken an isolated teaching from Mitsudo and improperly summarily concluded that it would be obvious adopt this teaching in the very different structure of Nakahara.

The Examiner bears the burden of establishing the existence of either 1) some objective teaching in the prior art or 2) knowledge generally available to one of ordinary skill in the art which would lead that individual to change the primary reference. In re Jones, 21 USPQ2d 1941, 1943-44 (Fed. Cir. 1992).

Section 103 does not allow the Examiner to engage in picking and choosing from the prior art only to the extent that it will support a holding of obviousness, while excluding parts of the prior art essential to the full appreciation of what the prior art suggests to one of ordinary skill in the art. In re Wesslau, 147 USPQ 391 (CCPA 1975).

It is respectfully submitted that without the benefit of applicant's disclosure, the skilled artisan would not obviously adopt a select and isolated characteristic of Mitsudo in Nakahara but, rather, would use the structures disclosed in these two references in the alternative.

Consequently, even though the feature of a ground electrode protruding length is disclosed in Mitsudo, Mitsudo does not motivate the skilled artisan to modify the very different structure of Nakahara to include this characteristic.

It is respectfully submitted that without the benefit of applicant's disclosure, the skilled artisan would not obviously combine the selected Mitsudo teaching identified by the Examiner with the disclosure of the primary reference. It is therefore submitted that the rejection based on Nakahara and Mitsudo is improper and should not be maintained.

Original claim 18 was rejected under 35 USC 103(a) as unpatentable over Nakahara in view of Chiu et al. Applicant respectfully traverses this rejection.

As noted above, Nakahara does not teach the claimed protrusion length of the ground electrode tip towards the center electrode nor the claimed cross sectional area of the center electrode tip and ground electrode tip. The Examiner seeks to overcome these deficiencies of Nakahara by relying upon the secondary reference to Chiu.

More particularly, Chiu is cited as disclosing cross sectional areas for the ground and center electrode tips in a range of .35 to .85 mm. These ground and center electrode tips, however, as illustrated in Figure 3, are axially aligned. Chiu does not provide any teaching or suggestion whatsoever with respect to cross sectional area ranges for center and ground electrode tips that are in a cross relationship as in Nakahara. The skilled artisan without the benefit of applicant's disclosure would not obviously and without motivation select the isolated teaching in Chiu noted by the Examiner and incorporate it in Nakahara. There is certainly no motivation for modifying Nakahara in view of Chiu's disclosure. Once again, the skilled artisan would follow the disclosure of Nakahara or follow the disclosure of Chiu, but would not attempt a piecemeal combination thereof as suggested by the Examiner. Without a proper motivation, the Examiner's suggested prior art combination would not obviously be undertaken by the skilled artisan.

It is clear that the initial burden of establishing a basis for denying patentability to a claimed invention rests upon the Examiner. In re Piasecki, 745 F. 2d 1468, 223 U.S.P.Q. 785 (Fed Cir. 1984). In establishing a *prima facie* case of obviousness under 35 U.S.C. § 103, it is

incumbent upon the Examiner to provide a reason why one of ordinary skill in the art would have been led to arrive at the claimed invention from the prior art. Ex part Clapp, 227 U.S.P.Q. 972 (BPAI 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from applicant's disclosure. See, for example, Uniroyal, Inc. v. Rudkin-Wiley Corp. 837 F.2d, 7 U.S.P.Q.2d 1434 (Fed. Cir. 1988).

As the CAFC has said, obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. ACS Hospital Systems v Montefiore Hospital, 221 USPQ 929, 933 (Fed. Cir. 1984). There must be a suggestion in the art relied upon to use what one reference discloses in or in combination with the disclosure of the other reference or references relied upon by the Examiner. In re Grabiak, 226 USPQ 870, 872 (Fed. Cir. 1986).

Thus, while Chiu discloses a ground electrode tip and a center electrode tip having a shape with a cross sectional area in the claimed range, Chiu does not teach or suggest that the adoption of such characteristics in the structure of Nakahara, much less in further combination with the claimed protruding length of the ground electrode tip. In this regard, it is respectfully submitted that in the absence of applicant's disclosure the skilled artisan would not "obviously" combine the three cited references to Nakahara, Mitsudo and Chiu. Firstly, as noted above, each of these three cited references discloses only one of the above-noted three characteristic features of the invention recited in independent claims 1, 5, 12 and 15. As such, each of these references fails to disclose two of the three characterizing features of the invention recited in these independent claims and thus none of the references cited by the Examiner recognized or suggests that a combination of the features claimed should be undertaken. Indeed, the purposes of each of the three cited references are different and not related to each other such that the skilled artisan would not be taught that the features of either of the secondary references should be combined with the primary reference much less that the invention claimed would result from such a combination. It is therefore respectfully submitted that the proposed prior art combination would not be made without the benefit of hindsight knowledge of applicant's disclosure. In view of the foregoing, reconsideration and withdrawal of the Examiner's rejection are respectfully requested.

Claims 19 and 21-24 were rejected under 35 USC 103(a) as unpatentable over Nakahara in view of Yamaguchi. This rejection has mooted by the revisions to claims 1, 5, 8, 12 and 15 above. Moreover, the reference to Yamaguchi does not overcome the deficiencies of the proposed combination of Nakahara, Mitsudo and Chiu noted above.

Claim 20 was rejected under 35 USC 103(a) as unpatentable over Nakahara in view of Bronchart. Applicant respectfully traverses this rejection.

This rejection has been mooted by the amendments to the independent claims noted above. The Examiner's further reliance on Bronchart does not overcome the deficiencies of the primary combinations advanced by the Examiner. It is therefore respectfully submitted that these claims are allowable as well.

Applicant notes with appreciation the Examiner's indication that claims 4, 7, and 11 contain allowable subject matter. Each of those claims has been presented in independent form above and should therefore be allowed.

Applicant notes with appreciation the Examiner's indication that claims 25-27 are allowed.

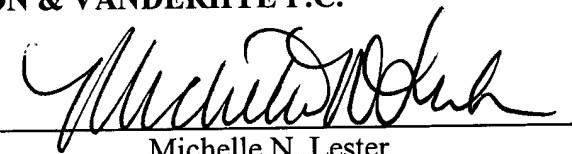
All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

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Respectfully submitted,

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